



# NASA Policy Directive

**NPD 8710.5C**Effective Date: September 26, 2003  
Expiration Date: September 26, 2014**COMPLIANCE IS MANDATORY**[Printable Format \(PDF\)](#)

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## **Subject: NASA Safety Policy for Pressure Vessels and Pressurized Systems (Revalidated 4/06/2006)**

**Responsible Office: Office of Safety and Mission Assurance**

### **1. POLICY**

To manage risk to people, facilities, and the environment posed by flight and ground-based pressure vessels and pressurized systems (PV/S) (including boilers), it is NASA policy to perform the following activities:

- a. Design, acquire, fabricate, inspect, test, install, repair and alter, operate, and maintain all new ground-based PV/S in accordance with the applicable codes, standards, guides, and regulations ([Requirement 30972](#)).
- b. Certify all new ground-based PV/S in accordance with this NPD prior to operation ([Requirement 30973](#)).
- c. Qualify and accept flight PV/S, including qualification units, in accordance with ANSI/AIAA S-080, Space Systems-Metallic Pressure Vessels, Pressurized Structures, and Pressure Components, and ANSI/AIAA S-081, Space Systems-Composite Overwrapped Pressure Vessels (COPV) ([Requirement 30974](#)).
- d. For ground-based PV/S (including flight PV/S used to support ground operations), where it is not practical (due to age or design) to meet the requirements of paragraph 1.a, evaluate, certify, and accept risk for specific operational parameters in accordance with NPR 8715.3, NASA Safety Manual, this NPD, and Center policy or procedure prior to operation ([Requirement 30975](#)).
- e. For flight PV/S, where it is not practical to meet the requirements of paragraph 1.c, evaluate, certify, and accept risk in accordance with program management risk acceptance requirements prior to operation ([Requirement 30976](#)).
- f. Exclude categories of ground-based PV/S or specific ground-based PV/S from the requirements of this NPD only after review, evaluation, and documentation of the rationale supporting the exclusion ([Requirement 30977](#)). (Typical examples are low-risk, off-the-shelf commercial systems that meet all commercial standards.)
- g. Perform inservice inspection and recertification for all ground-based PV/S to ensure their ongoing fitness for service, and to document and assess relevant changes in condition or knowledge that materially affect risk assessment ([Requirement 30978](#)).
- h. Document and maintain the certification status of PV/S to indicate all waivers, variances, nonconformances, special constraints, or instructions required for safe operation of the PV/S ([Requirement 30979](#)).
- i. Ensure that PV/S are operated and maintained by skilled, adequately trained, and qualified personnel who shall be certified in accordance with NPR 8715.3 ([Requirement 30980](#)).
- j. Establish a configuration management program to control the engineering and maintenance changes made to PV/S ([Requirement 30981](#)).
- k. Process variances in accordance with the following policy:
  - (1) Differences between the policy contained within this NPD and Center policy shall be processed as a variance in accordance with NPR 8715.3 ([Requirement 30927](#)).
  - (2) All other variances shall be processed as technical variances as follows:
    - (a) The level of risk shall be evaluated based on probability and severity, documented in accordance with NPR 8715.3, and accepted in accordance with this NPD ([Requirement 30929](#)).
    - (b) A risk acceptance plan must be developed to support items such as operational and maintenance parameters, deviations from the requirements, special constraints or instructions required for safe operation, special training

needs, required personal protective equipment, inspection criteria, engineering controls, and procedural controls that must be in place prior to operation ([Requirement 30930](#)).

## 2. APPLICABILITY

- a. This NPD applies to NASA Headquarters and NASA Centers, including Component Facilities, and to the Jet Propulsion Laboratory and to other contractors to the extent specified in the contract.
- b. This NPD applies to NASA-owned or -operated, temporary or permanent ground-based PV/S and flight PV/S, and to non-NASA-owned contractor or tenant PV/S operated on NASA property if those PV/S are determined to pose a risk to NASA personnel, facilities, or equipment.

## 3. AUTHORITY

- a. 42 U.S.C. 2473(c)(1), Section 203(c)(1) of the National Aeronautics and Space Act of 1958, as amended.
- b. Department of Labor (DOL), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910, Occupational Safety and Health Standards.

## 4. REFERENCES

- a. Reserved.
- b. NPR 8715.3, NASA Safety Manual.
- c. AIAA S-080, Space Systems-Metallic Pressure Vessels, Pressurized Structures, and Pressure Components.
- d. AIAA S-081, Space Systems-Composite Overwrapped Pressure Vessels (COPV).

## 5. RESPONSIBILITY

- a. The Chief Safety and Mission Assurance Officer shall ensure that Centers and programs establish and document their PV/S program in accordance with this NPD ([Requirement 30937](#)).
- b. Mission Directorate Associate Administrators shall approve policy variances in accordance with NPR 8715.3 and this document ([Requirement 30938](#)).
- c. Center flight program managers shall perform the following activities:
  - (1) Designate an individual with responsibility for establishing a qualification and acceptance or recertification process to ensure safe and reliable testing and use of flight PV/S ([Requirement 30940](#)).
  - (2) Evaluate and accept the risks of and qualify flight systems in accordance with paragraphs 1.c and 1.e ([Requirement 30941](#)).
- d. Center Directors, including Directors of Component Facilities, shall perform the following activities:
  - (1) Designate an individual to serve as Pressure Systems Manager (PSM) ([Requirement 30943](#)).
  - (2) Develop risk acceptance plans, approve variances, and accept the risks of operation in accordance with this NPD and the risk matrix contained in NPR 8715.3 for PV/S with Risk Acceptance Code (RAC) 1 or 2 after mitigation (residual risk) ([Requirement 30944](#)).
  - (3) Provide sufficient resources to implement the PV/S program ([Requirement 30945](#)).
  - (4) Direct application of this NPD to non-NASA-owned PV/S that pose risks to NASA personnel, facilities, equipment, or property through contract provisions or other means, based on guidance from the PSM ([Requirement 30946](#)).
- e. The management of the organization responsible for the PV/S shall perform the following activities:
  - (1) Ensure that operating and maintenance procedures are developed and implemented to assure compliance with the operational limits of the PV/S ([Requirement 30948](#)).
  - (2) Ensure personnel are properly trained, qualified, and certified (when required) to operate a specific PV/S ([Requirement 30949](#)).
  - (3) Submit designs or procurement specifications for new PV/S or modifications to existing PV/S for review and evaluation by the PSM or designee prior to initiating the procurement action or the modification ([Requirement 30950](#)).

(4) Acquire, test, install, repair, and alter PV/S items in accordance with the requirements of this NPD and the design specifications ([Requirement 30951](#)).

(5) Ensure all PV/S are certified (or qualified/accepted) in accordance with this NPD prior to use ([Requirement 30952](#)).

(6) Develop a risk acceptance plan, approve variances, and accept the risks of operation for PV/S with RAC 3 or greater after mitigation (residual risk) in accordance with this NPD and the risk matrix contained in NPR 8715.3 ([Requirement 30953](#)).

f. The PSM shall perform the following activities:

(1) Ensure that Center-specific procedures are developed and implemented for PV/S design, acquisition, construction, operation, testing, installation, alteration, repair and maintenance, inspection and certification, and documentation of noncompliance to meet the requirements of this NPD ([Requirement 30955](#)).

(2) Establish a process to document all waivers, variances, nonconformances, special constraints, or instructions required for safe operation of PV/S (see paragraph 1.h) ([Requirement 30956](#)).

(3) Evaluate and certify PV/S in accordance with paragraph 1.b or paragraph 1.d prior to operation ([Requirement 30957](#)).

(4) Review design specifications for compliance with this NPD. ([Requirement 30958](#)).

(5) Serve as the final authority on national consensus standards that apply to ground-based PV/S and provide final interpretation of national consensus standard application(s) to the Center ([Requirement 30959](#)).

(6) Review and concur/nonconcur with variance requests and forward to the Center Director or responsible organization for acceptance ([Requirement 30960](#)).

(7) With the aid of the responsible Contracting Officer, apply this NPD to the contractor or tenant operation if a non-NASA-owned PV/S operated on NASA property poses risk to NASA personnel, facilities, or equipment ([Requirement 30961](#)).

(8) Identify specific PV/S or categories of PV/S that need not be subject to the requirements of the NPD and document the rationale for the exclusion ([Requirement 30962](#)).

(9) Develop and maintain a PV/S configuration management program (see paragraph 1.j) ([Requirement 30963](#)).

g. The Contracting Officer or other NASA Authorizing Official shall perform the following activities:

(1) Notify the PSM of a proposed procurement for PV/S which has not been reviewed by the PSM per paragraph 5.e.(3) ([Requirement 30965](#)).

(2) On advice of the PSM, and direction of Center management, impose the requirements of this NPD on agreements, contracts, loans, acquisitions, memoranda of agreement, joint use agreements, or tenant operations ([Requirement 30966](#)).

h. Center or Component Facility safety directors shall establish processes to review and concur in all variance requests that have safety implications and ensure that the risk documentation and communication process is consistent with NPR 8715.3 ([Requirement 30967](#)).

## 6. DELEGATION OF AUTHORITY

None.

## 7. MEASUREMENTS

None.

## 8. CANCELLATION

NPD 8710.5A, dated September 26, 2003.

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REVALIDATED April 6, 2006, original signed by

/s/ Sean O'Keefe

## Administrator

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### ATTACHMENT A: (TEXT)

None.

### (URL for Graphic)

None.

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